

**FAUNAL AND EROSIONAL EVENTS IN THE EASTERN TETHYAN SEA ACROSS THE K/T BOUNDARY;** G. Keller, Dept. of Geological and Geophysical Sciences, Princeton University, Princeton, New Jersey 08544, C. Benjamini, Dept. of Geology and Mineralogy, Ben Gurion, University of the Negev, Beer Sheva, Israel

A regional pattern of three closely spaced erosional events at and above the K/T boundary has been determined from six Cretaceous/Tertiary boundary sections in the Negev of Israel. The sections were collected from locations throughout the central and northern Negev. All sections are lithologically similar. The Maastrichtian consists of a sequence of limestone beds intercalated with thin marly beds. In some sections, the last limestone bed is followed by 1-2 m of calcareous marls grading upwards into several meters of grey shale. In other sections the limestone bed is followed directly by grey shale with the contact containing particles of limestone and marl. A 5-20 cm thick dark grey organic-rich clay layer is present about 1.5-2.5 m above the base of the grey shale. The grey shale grades upwards into increasingly carbonate rich marls.

No unconformities are apparent in field outcrops. During field collection the dark grey clay layer was believed to represent the K/T boundary clay. Microfossil analysis however identified the boundary at the base of the grey shale. The black shale represents a low productivity anoxic event similar to, but younger than, the K/T boundary clay in other K/T boundary sections.

High resolution planktic foraminiferal and carbonate analysis of these sections (at 5-10 cm intervals) yield surprising results. In nearly all sections, all Danian Zones (P0, P1a, P1b, P1c) are present (Figure 1). However, sudden changes in species population abundances, increase in benthic foraminifera and low carbonate values clearly mark erosional events associated with increased carbonate dissolution.

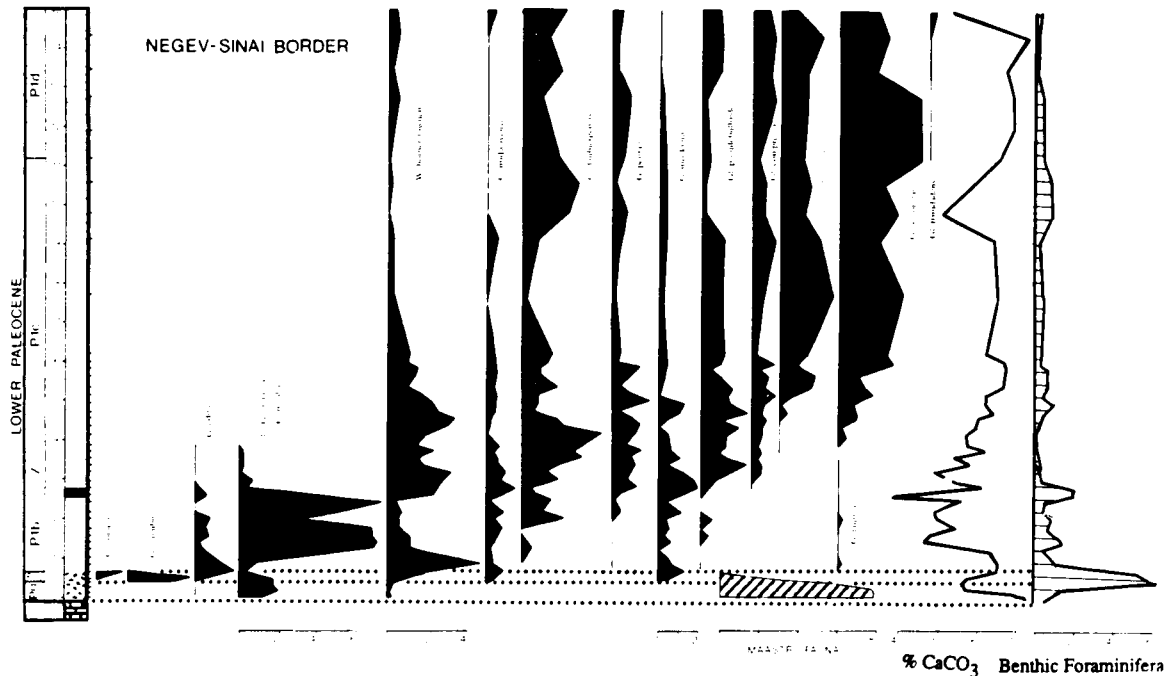
The K/T boundary is marked by an erosional event which removed part or all of the uppermost Maastrichtian marls above the last limestone bed. The earliest Danian Zone P0 is represented by a grey shale containing numerous redish tan-colored microclasts of limestone and marl. These microclasts are believed to be reworked Maastrichtian sediments. They account for the high percentage of Maastrichtian fauna (80%) among the early Danian fauna in the basal 10-20 cm of the grey shale (Figure 1). Zone P1a is very short (10-20 cm) in all sections. The age diagnostic species of this Zone (*Globigerina eugubina* and *G. conusa*) are abundant, but truncated above and below (Figure 1). This indicates an erosional event between Zones P0 and P1a and a second erosional event between Zones P1a and P1b.

Percent carbonate data for four Negev sections are illustrated in Figure 2 and show the regional similarities in carbonate sedimentation. All sections start at the last Maastrichtian limestone bed. Note the absence of Maastrichtian marl in the Sinai/Negev section. The K/T boundary correlation is based on microfossils. The carbonate values vary because of the K/T boundary hiatus and because of reworked carbonate rich Maastrichtian sediments in Zones P0 to P1a. Correlation line 1 marks a significant drop in carbonate sedimentation and surface water productivity (1). This event is marked by high abundance of *Guembelitra* (Figure 1) which thrives during times of low productivity. Correlation line 2 marks the dark grey clay layer associated with a drop in carbonate sedimentation. This event marks the final decline of the *Guembelitra* group and leads to their extinction shortly thereafter. This clay layer has not been observed in sections outside the Negev.

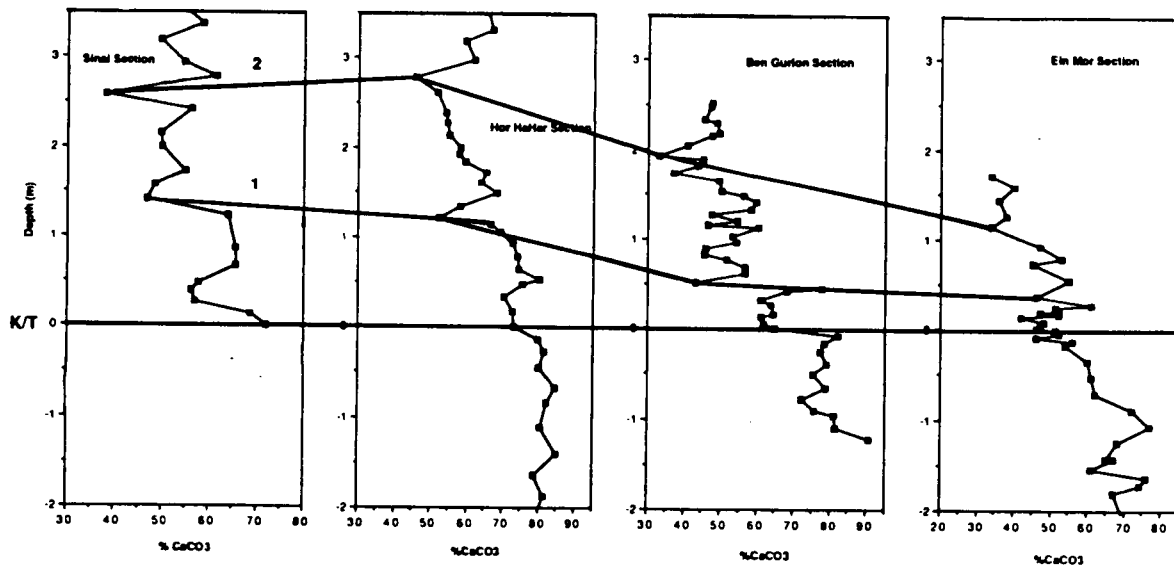
Faunal and carbonate data from the Negev sections thus show three closely spaced short erosional events at the K/T boundary and within the first 50,000 to 100,000 years of the Danian. The K/T boundary erosional event was the most intense as noted in the abundant microclasts of reworked sediments as well as removal of a greater although variable section of uppermost Maastrichtian marl. Benthic foraminiferal data indicate an outer neritic to upper bathyal depth at this time.

These K/T boundary erosional events may represent global climatic or paleoceanographic events. For instance, the Brazos River, Texas, sections show a "stormbed"

deposit at the K/T boundary with rip-up clasts, glauconite and shell fragments. In these sections Zone P0 is very short and may also contain the second erosional event. A short hiatus is observed between Zone P1a/P1b corresponding to the third erosional event observed in the Negev.



**Figure 1. Faunal abundance and carbonate data from the Negev-Sinai border section. Dotted lines mark 3 hiatuses.**



**Figure 2. Bulk sediment carbonate data from four Negev K/T boundary sections.**